فهرست

CONTENT

Studying Land Use-Cover Changes during the Last Three Decades in Hamedan Province using Satellite Images

Jalil Imani Harsini [1], Mohammad Kaboli [2*], Jahangir Feghhi [3], Ali Taherzadeh [4], Atefeh Asadi [5]

1. MSc., Department of Environmental Sciences, Faculty of Natural Resources, University of Tehran, Tehran, Iran

2,3. Associate Professor, Department of Environmental Sciences, Faculty of Natural Resources, University of Tehran, Tehran, Iran

4. MSc., Remote Sensing, Iranian Space Agency, Iran

5. MSc., Department of Energy and Environment, Science and Research Branch, Islamic Azad University, Tehran, Iran

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Abstract

During the time, land cover and as a result land use patterns go through fundamental changes and human factors can have the most important role in this process. Knowing these changes could be of great help to the future management of this region. According to this, the main purpose of this study is to monitor the land use-cover changes in the Hamedan province area during the three recent decades. Therefore, in order to discover the changes created in the study area, images of TM satellite sensor (1989), ETM satellite sensor (2000) and LISS3 detector of IRS (2008) were processed. Then after performing needed preprocesses, the enhancements were performed and then by using supervised classification with Maximum likelihood method, land-use cover objective maps were prepared. These maps were compared with the Post classification comparison method in form of a couple in the first period between 1989-2000 and the second period between 2008-2009. The results shows that the area of the land use-cover classes, rangelands and plain lands were decreased during the three decades and on the other hand water area, arid and residential-industrial area were increasing during this period. Woodland areas decreased during the first period and increased in the second period. However, farmlands' area increased during the first period and decreased during the second one.

Keywords: change detection, Hamedan province, land use-cover, satellite images.

* Corresponding Author: Tel: +98 2632223044, Fax: +98 2632229683 E-mail: mkaboli@ut.ac.ir

Using the Tobit Model for Determining the Effective Factors in Visitors' Willingness to Payment for Jolfa's Asiab Kharabe Fall

Ghader Dashti [1*], Shadi Hosseini [2]

1. Associate Professor, Department of Agricultural Economics, Faculty of Agriculture, University of Tabriz, Tabriz,Iran

2. Former Graduate Student in Agricultural Economics, University of Tabriz, Tabriz, Iran

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Abstract

In recent decades, tourism has been considered as a way to decreasing tensions of urban life. This study tried to determine the effective factors in visitors' willingness to pay for Asiab Kharabeh fall by using Tobit model. Data set were obtained by completing questionnaires and interviewing with 125 individuals who visit the fall. According to the results 69.6 percent of visitors were ready to pay as an admission for visiting the fall and the mean was about 4312 Rials per year. The results show that the variables income, tendency of staying in waterfall at night and membership in NGO environmental organization has significant and positive and variables include age, distance and household leadership have significant and negative effect on visitors' WTP for Asiab Kharabeh fall.

Keywords: Asiab Kharabe fall, contingent valuation, Jolfa, Tobit Model, willingness to pay.

* Corresponding Author: Tel: +98 4113392785 Email: Ghdashti@yahoo.com

Assessment of Climate Change and its Impacts on the Natural Land use of Gorgan River Basin

Seyede Shole Hosseini [1], Hamid Reza Ghaffarzadeh [2], Zahra Abedi [3], Nima Shiry [4*]

1. MSc. in Environmental Sciences, Azad University, Researches and sciences Unit, Tehran, Iran.
2,3. Associate Professor, Faculty of Environmental Sciences and Energy, Azad University, Researches and Sciences Unit, Tehran, Iran.
4. Department of Natural sciences, University of Tehran, Karaj, Iran.

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Abstract

The objective of this study is to investigate of climate change in Gorgan river-Gharesoo basin and these impacts of this phenomenon on regional land use change, as well as provide guidance on the effective management and conservation of natural land area. Analysis of climate data including rainfall, average temperature and relative humidity of nine synoptic stations in this area from East to West, with a subscriber base of 30 years (1981 to 2011), to examine the homogeneity of data and determine trends of changes in the time series of meteorological variables and calculation of the standardized precipitation index (SPI) based on rainfall recorded this time. In addition, to digitize maps of land use obtained from the cartography of the country (at two time) and convert into vector maps by ILWIS 3.3 software, although, in order to analyze the land use maps, prepare the output maps and finally compare of user specified percentage changes utilized by Arc GIS 9.3 was used. Results indicated, during the study (30 years) the annual rainfall than central areas of the basin, has increased and rainfall could increase the occurrence of floods probe and be effective in this area. Based on seasonal temperature fluctuations, temperature changes in the eastern half of the rising and in the central and western parts declined. Also, changes of humidity in the eastern and the western parts of the basin were rising but the downward trends humidity scattered in different parts of this area. The annual average temperature and relative humidity of these regions have increased. Moreover, Findings from SPI indicated that almost in all stations of this basin, humidity has also improved and frequency of rainy and wet years of last two decades significantly has increased. In other words, changes in normal conditions of meteorological variables were climate changes actually and this phenomenon has occurred in Gorgan river-Gharesoo basin. Results from output maps showed that changes during this period (10 years) have been reduced ranges and forests and have been increased agricultural and arid lands in this basin. Since the greatest changes in land use during this time period, converting more lands to agricultural land has been, thus, the population growth has been one of the most effective agents. Meanwhile, converting some lands to arid lands indicate that the effects of climate change on the land use change.

Keywords: climate change, Gorgan River Basin, land use, SPI.

* Corresponding Author: Tel: +98 9361802937 E-mail: nima.shiry@gmail.com

Economic Analysis of Current Alternatives of Meighan Wetland Utilization

Ali Lotfi [1], Seyed Mehdi Heshmatol Vaezin [2]*, Mohammadreza Guili [3], Azadeh Kazemi [4]

1. Assistant Professor, Faculty of Natural Resources, Isfahan University of Technology, Iran.
2. Assistant professor, Faculty of Natural Resources, University of Tehran, Karaj, Iran.
3. Assistant professor, Faculty of Natural Resources, Malayer University, Iran.
4. PhD Candidate, Faculty of Environment, University of Tehran, Iran.

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Abstract

External costs of environmental degradation are often ignored in economic analysis of projects. The mail goal of the paper is to economically analyze the current alternatives of Meighan wetland utilization including extraction of sodium sulfate, aquaculture of artemia and integrative alternative considering external costs of wetland degradation. In order to detect eventual degradation of wetland, Landsat ETM+ and Google Earth images of the region and hydrologic data have been used during the period 2000-2012. Then, all benefits and costs of current utilization alternatives have been estimated. To do this, all necessary data has been collected using sodium sulfate extraction company, aquaculture investment project and field data. External costs of wetland degradation have been estimated using replacement cost technique (wetland restoration) and the base unit price list of construction activities. Then, all prices have been adjusted to the price level of 2013 using Consumer Price Index (CPI). Finally, all alternatives have been financially evaluated using the equivalent annual net present value (EANPV) criterion with a real discount rate of 3.5%. Results showed that due to hydrological deficit (high potential evapo-transpiration), the wetland area has been decreased with an annual rate of 3.5%. As such, the impact of sodium sulfate extraction on the drying trend of the wetland seemed to be minor. However, sodium sulfate extraction deepens the wetland and thus may contribute in the observed drying trend. Results revealed that sodium sulfate extraction impose as such an annual external cost of 6.4 billion Rials (wetland restoration). Based on results, sodium sulfate extraction and aquaculture of artemia, respectively in 800 and 2550 hectares of the wetland area, generate potentially an annual net present value of 10.7 and 46.9 billion Rials. Results also showed that accounting for external costs decreased the annual net present value of sodium sulfate extraction to 4.3 billion Rials. As scuh, if restoration activities take place at due times and places, this alternative may not be conceived as economically or environmentally unsustainable. Finally, integrative alternative (extraction, restoration and aquaculture) with an annual net present value of 51.2 billion Rials appeared to be the best current alternative. Further researches are needed to value other benefits of the Meighan wetland including biodiversity conservation and tourism.

Keywords: cost benefit analysis, equivalent annual net present value, replacement cost, restoration, wetland.

* Corresponding Author: Tel: +98 2632223044 Email: mheshmat@ut.ac.ir

Investigating the Diversity of Plant Species around Zarivar Lake in Marivan

Nematollah Khorasani [1], Borhan Riazi [2], Ataollah Aliehiaee [3*]

1. Professor, Faculty of Natural Resources, University of Tehran, Iran.
2. Assistant Professor, Faculty of Environment and Energy, Islamic Azad University, Research and Science Unit, Tehran, Iran.
3. MSc. on Biodiversity & Diversity of habitats, Faculty Environment & Energy, Islamic Azad University, Research and Science Unit, Tehran, Iran.

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Abstract

Zarivar lake is the only natural water area and the ponds in the Kurdistan province which is located 2 kilometers far from the northwest of Marivan city and at an altitude of 1285 meters above sea level. The mean annual rainfall is 997.6 mm and the mean annual temperature is 13°C. This study is carried out to survey the biodiversity, identification and introduce plant species around the lake and determination of biological forms and their chorology so that the result was identify 257 plant species belonging to 53 families and 183 genera. The vegetation spectrum indicates a dominant therophyte biological form with a coverage of 42 percent followed by Hemicryptophyte %38.1, cryptophyte %16, phanerophyte %2.4 and chamephyte %1.5. The Survey of Geographic Spectrum of studied area Shows that most elements (99 species) belong to the Vegetative area of Iran and Turan. In addition, according to IUCN categories and book Red data book of Iran , three categories of plant species so called vulnerable , lower risk and Data deficient in the studied area Has been identified that Shows 11 plant species are Totally considered threatened species. Further, the only carnivorous plant in Iran (Utricularia neglecta), have been identified in this study.

Keywords: biological form, chorology, flora, Marivan, Zarivar lake**.**

* Corresponding Auther: Tel: +98-9364886770 E-mail: ehiaee_ata@yahoo.com

Biocriteria Demonstrating of Air Pollution Stress on the Plane-Tree (*Platanus orientalis* L.)

Zeinab Rafiee [1], Nourollah Mirghaffari [2*], Sayed Hamid Matinkhah [3]

1. MSc., Department of Natural Resources, Isfahan University of Technology, Isfahan, Iran.
2. Associate Professor, Department of Natural Resources, Isfahan University of Technology, Isfahan, Iran.
3. Assistance Professor, Department of Natural Resources, Isfahan University of Technology, Isfahan, Iran

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Abstract

Increasing energy demands associated with economic growth and industrialization have resulted in dramatic increases in air pollution emissions. Air pollution damages the plant mainly by disrupting cell homeostatic conditions. In the present study, diverse plant criteria indicating air pollution from different levels including cell biochemistry, leaf and tree crown in the plane-tree were determined, and their relation to the air pollutants such as ozone, nitrous oxide, nitrogen dioxide, sulfur dioxide, carbon dioxide and particulates was investigated. Results showed that the concentration of Chlorophyll a and chlorophyll b in the leaf of plane-tree are reduced with increase in the ozone concentration in the air. The concentration of Chlorophyll a and chlorophyll b are negatively correlated with NO in the autumn (r= -0.69 and -0.72, respectively). Specific leaf area showed a positive relation with the concentration of ozone, nitrogen dioxide and carbon monoxide ($P<0.05$). Crown transparency did not show any relation with air pollutants. On the contrary, crown area ratio was positively correlated with NO_2 in the summer ($P<0.05$). Specific leaf area was a good indicator of air pollution stress and damage to sycamore especially in the spring. Moreover, crown area ratio responded better than crown transparency to air pollutants and can be a suitable indicator of NO_2 effect on the plane-tree. This criterion has a large potential as an indicator of various stresses on the tree due to its fast and easy measurement by a consumer-grade digital camera and available image processing software.

Keywords: air pollution, chlorophyll, crown defoliation, plane-tree, specific leaf area.

* Corresponding Author: Tel: +98 311 3912841,Fax: +98 311 3912840 Email: mnorolah@cc.iut.ac.ir

Investigation of Heavy Metal Concentrations in Sediment, Fish and Common Reed in Sattarkhan Dam, Azarbayjan-Sharghi, Iran

Maryam Zareh Reshqooeieh [1], Amir Hossein Hamidian [2*], Hadi Poorbagher [3], Sohrab Ashrafi [4]

1. MSc. Student, Department of Environment, Faculty of Natural Resources, University of Tehran, Karaj, Iran.
2,4. Assistant Professor, Department of Environment, Faculty of Natural Resources, University of Tehran, Karaj, Iran.
3. Assistant Professor, Department of Fishery, Faculty of Natural Resources, University of Tehran, Karaj, Iran.

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Abstract

Increasing industrial activities lead to entrance of different pollutants into the environment, especially water resources. Because of their persistency and non-biodegradation, metals can pose a threat to health of human and other organisms. Sediment, fish (*lucioperca Stizostedion and Cyprinus carpio*), and common reed (***Phragmites australis***) samples were collected from Sattarkhan dam for investigating their heavy metal concentrations. Dry and ashed sediment, fish, and common reed samples were digested using concentrated nitric acid and their heavy metals (As, Cu and Cd) concentrations were measured using an ICP-OES instrument. One-way ANOVA test was used to examine the difference among accumulation of various metals in plant, sediment and fish. Results showed that there were significant differences between metal concentrations in samples ($P<0.001$). No correlation was found among concentration of metals in sediment, plant and fish samples. Arsenic in sediments and arsenic and cadmium in fish tissues were higher than the international standards. Calculation of bioaccumulation factor (BAF) showed that *Phragmites australis* can accumulate these metals and may be used as their bioindicator in aquatic environments. Based on the high concentrations of metals which determined in sediment and fish samples, monitoring and controlling of heavy metals in this ecosystem are considered as a necessary approach.

Keywords: arsenic, bioaccumulation, fish, cadmium, copper, Sattarkhan dam.

* Corresponding Author: Tel: +98 9109774245 Email: a.hamidian@ut.ac.ir

Factors Effective on Environmental Attitude of Owners and Managers of Agricultural SMEs in Kermanshah and Ilam Provinces

Zohreh Motamedi Nia [1*], Abdolhamid Papzan [2], Hossein Mahdizadeh [3]

1. Lecturers, Payam-e-Noor University, Ilam, Iran.
2. Associate Professor, Extension & Rural Development, Department, Razi University, Iran.
3. Assistant Professor, Entrepreneurship and Rural Development, Department, Ilam University, Iran

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Abstract

The main purpose of this research was to determinate the factors effective on environmental attitude of owners and managers of Small and Medium-Sized Enterprises (SMEs) by Using Structural Equation Modeling. According to the data from agriculture department of two counties, small and medium-Sized enterprises were estimated at 540 units. Using Cochran's formula determined the sample & 202 owners and managers who have been stratified sampling method. For gathering data we used the revised version of New Environmental Paradigm (NEP) and closed questionnaire. Content validity of the questionnaire was tested by the ideas of professors of Razi University. Cronbach's alpha was used to estimate reliability of the questionnaire (79%). Results indicated that 90% (182 respondents) of the owners and managers of agricultural SMEs agree with "plants and animals have as much right as humans to exist" and 64% (130 respondents) of them opposed with "the balance of nature is strong enough to cope with the impact of modern industrial nations". Also level of education, educated members of family, ethnicity, urbanization and participate in classes and workshops in field of environmental education explain a large proportion of the variance of environmental attitude.

Keywords: antianthropocentrism, Environmental attitude (EA), fragility of nature's balance, limits to growth, possibility of an eco-crisis, rejection of exemptionalism, Small and Medium-Sized Enterprises (SMEs), structural equation modeling.

* Corresponding Author: Tel: +98 8412223671 Email: zohre.motamedi@gmail.com

Site Selection of Landfill by Using Analytical Hierarchy Process (AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) (Case Study: Landfill of Golpayegan Township)

Mojgan Mirzaei [1*], Abdollrasoul Salman Mahiny [2], Seyed Hamed Mirkarimi [3]

1. MSc. in Environmental Science, Agriculture Sciences and Natural Resources, University of Gorgan, Iran.
2. Associate Professor, College of Fisheries and Environmental Sciences, Agriculture Sciences and Natural Resources, University of Gorgan, Iran.
3. Assistant Professor, College of Fisheries and Environmental Sciences, Agriculture Sciences and Natural Resources, University of Gorgan, Iran.

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Abstract

Solid waste municipal landfill can have significant health, economic and environmental effects. Therefore, there is a need to comprehensive land evaluation for locating the best landfill place. The purpose of this paper is showcasing the process undertaken to locate the best landfill site for municipal solid waste of Golpayegan Township. At first, three alternatives were proposed after field surveys from March 2011 to September 2011 and analyses in ARCGIS software and applying standards and important criteria in site selection of landfill and then the best option was selected. Scientific methods used in this study were the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) and the Analytical Hierarchy Process (AHP) that are two practical methods of Multi-Criteria Decision-Making (MCDM). For identification of preferences and weighting of the project activities the AHP was applied in IDRISI software. Based on the result from AHP, material transportation, clearing of trees, excavations, draining, establishment of roads and destruction of buildings in site selection of landfill were rated by the weights of 0.45, 0.22, 0.14, 0.090, 0.060 and 0.040, respectively. Then, using TOPSIS method the relative closeness to the ideal solutions in 3 alternatives were calculated at 0.259, 0.272 and 0.754 for alternative 1, 2 and 3 respectively and alternative 3 was determined as the best for landfill in Golpayegan Township.

Keywords: analytical hierarchy process, Golpayegan, site selection, TOPSIS method, waste landfill.

* Corresponding Author: Tel: +98 9384470989 Email: Mojgan_11884@yahoo.com

Environmental Sensitivity of Coastal Ecosystems in Hormozgan Province

Maryam Yaghoubzadeh [1], Afshin Danehkar [2*], Bahman Jabbarian Amiri [3], Sohrab Ashrafi [4]

1. MSc of Environment, Department of Environmental Science, Faculty of Natural Resources, University of Tehran, Karaj, Iran.
2. Associate Professor, Department of Environmental Science, Faculty of Natural Resources, University of Tehran, Karaj, Iran.
3,4. Assistant Professor, Department of Environmental Science, Faculty of Natural Resources, University of Tehran, Karaj, Iran.

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Abstract

Sensitive coastal areas are fragile ecosystems affected by geographic features and in the same time settlements were developed around these areas due to their ecological capability. Coastal ecosystems due to their countless benefits are very important for protection. Hence, this paper attempts to determine the sensitivity of coastal ecosystem to disturbances in Hormozgan Province. We reviewed 22 international and national studies to notice identification criteria for determination the coastal sensitive areas. We used 6 criteria and 29 indicators to select these regions. Exclusiveness and wilderness were the most important coefficients while industrial dependency had the lowest priority among the indicators. Moreover, 10 ecosystems were studied to determine importance and priority of sensitivity of ecosystems in the study area in shore and coastal zone. According to the results, mangroves in seashore besides protected coastal area are of the most important sensitive regions. Zoning of sensitive ecosystems shows that the most extent areas are the least sensitive ones in the coastal zone. Few areas are in the highly sensitive in the vicinity of Bandarlenge city. 6.96% of Very high sensitive parts are in southwest of Bandarlenge city that overlap with Seraj and Harra Protected Areas.

Keyword: coastal ecosystems, coastal sensitive area, environmental sensitivity, Hormozgan.

[*]Corresponding Author: Telefax: +98 26 32229721 E-mail:Danehkar@ut.ac.ir